

# Work Order ID 72974

Tuesday, August 23, 2011 8:15:03 AM

U/R

Page 1

Item ID: D206-667-201TRN

Accept

Revision ID: U/R OK QP 11.09.27

Item Name: Crosstube Turning Detail

Start Date: 8/23/2011 Start Qty: 1.00

Required Date: 9/7/2011 Req'd Qty: 1.00

Reference:

Approvals: Process Plan: *[Signature]*

QC:

Date: 11-08-23

Date:

Tooling:

SPC (Y/N):

Date:

Date:

Run Start

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID Tool # Plan Accept Reject Reject Insp.  
Code Qty Qty Number Stamp

Draw Nbr

Revision Nbr

D206-667-241

Rev C

OK QP 11.09.27

100

0.00



Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA084

2-Turn first side as per Folio FA084

3-Blend transition lines only, \*\*do not sand whole tube\*\*.

\*Use mill bastard file, brush file repeatedly with file card.

\*Do not use sandpaper coarser than 320 grit.

man.L 11/09/21

110

QC1- Inspect dimensions to dimension sheet

0.00



QC

Memo

0.00

Quality Control

man.L 11/09/21

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**Work Order ID 72974**

Page 2

Tuesday, August 23, 2011 8:15:03 AM

Item ID: D206-667-201TRN

Accept



Setup Start



Revision ID: U/R

Stop



Item Name: Crosstube Turning Detail

Start Date: 8/23/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 9/7/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

120



Mori Seiki

MORI SEIKI CNC LATHE LARGE

0.00

Memo

0.00

Mori Seiki CNC Lathe Large

1-Turn second side as per Folio FA084

2-File down transition lines smooth.

3-Blend transition lines only, \*\*do not sand whole tube\*\*:

\*Use mill bastard file, brush file repeatedly with file card.

\*Do not use sandpaper coarser than 320 grit.

L #  
mm.L 11/09/21

130



QC

Quality Control

QC1- Inspect dimensions to dimension sheet

0.00

Memo

0.00

L #  
mm.L 11/09/21

140



QC

Quality Control

QC8- Inspect parts - second check

0.00

Memo

0.00

mm.L 11/09/21  
L #

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Work Order ID 72974

Tuesday, August 23, 2011 8:15:03 AM



Page 3

Item ID: D206-667-201TRN

Accept



Setup Start



Revision ID: U/R

Stop



Item Name: Crosstube Turning Detail

Start Date: 8/23/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 9/7/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: Date:

Tooling: Date:

QC: Date:

SPC (Y/N): Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID Tool # Plan Accept Reject Reject Insp.  
Code Qty Qty Number Stamp

150

Crosstubes Chemical Conversion

0.00

SW

11-09-22



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

160

QC3- Inspect Part Finish

0.00

DD

11-9-23



QC

Memo

0.00

Quality Control

170

Packaging

0.00

DD

11-9-23



Packaging

Memo

0.00

Packaging

Identify and Stock in kanban rack Location:

46

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**Work Order ID 72974**

Tuesday, August 23, 2011 8:15:03 AM



Page 4

Item ID: D206-667-201TRN

Accept



Setup Start



Revision ID: U/R

Stop



Item Name: Crosstube Turning Detail

Start Date: 8/23/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 9/7/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_

Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_

SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

180

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

11/9/27  
ME  
11-09-26

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



# Picklist Print

Tuesday, August 23, 2011 8:15:09 AM

Page 1

Work Order ID: 72974



Parent Item: D206-667-201TRN



Parent Item Name: Crosstube Turning Detail

Start Date: 8/23/2011

Required Date: 9/7/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec  
 IPP Rev B 08.04.02 Removed polish EC verified by:DD  
 IPP Rev:C 08-12-23 revc as per dwg DD verified by JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6003-102		Manufactured	No			110	Each	61.0000	1	1			

Crosstube, 206

Location	Loc Qty	Loc Code
LG	61	
29116	12	
38335	49	

mm.l 1/109/21

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b>	27974
<b>Description:</b> Crosstube Assembly		<b>Part Number:</b>	D206-667-241
<b>Inspection Dwg:</b> D206-667-241 <b>Rev:</b> C		<b>Page 1 of 1</b>	

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	30° x 0.500	+/-0.010	30° x .500	/		vern	cwc-08
	0.250	+/-0.010	.250	/		"	
	2.240	+0.005/-0.000	2.241	/		"	
	4.438	+/-0.030	4.435	/		"	
	1.780	+0.005/-0.000	1.784	/		"	
	R0.063	+/-0.010	.063	/		RG	
	1.851	+0.005/-0.000	1.855	/		vern	cwc-08
	1.928	+0.005/-0.000	1.932	/		"	
	2.005	+0.005/-0.000	2.008	/		"	
	2.082	+0.005/-0.000	2.086	/		"	
	2.159	+0.005/-0.000	2.162	/		"	
	2.190	+0.005/-0.000	2.193	/		"	
SIDE B	30° x 0.500	+/-0.010	30° x .500	/		vern	cwc-08
	0.250	+/-0.010	.250	/		"	
	2.240	+0.005/-0.000	2.243	/		"	
	4.438	+/-0.030	4.435	/		"	
	1.780	+0.005/-0.000	1.785	/		"	
	R0.063	+/-0.010	.063	/		RG	
	1.851	+0.005/-0.000	1.856	/		vern	cwc-08
	1.928	+0.005/-0.000	1.931	/		"	
	2.005	+0.005/-0.000	2.008	/		"	
	2.082	+0.005/-0.000	2.086	/		"	
	2.159	+0.005/-0.000	2.162	/		"	
	2.190	+0.005/-0.000	2.193	/		"	
	100.60	+/-0.020	100.60	/		face	mm-02

<b>Measured by:</b>	mm-1	<b>Audited by:</b>	mm-1	<b>Prototype Approval:</b>	N/A
<b>Date:</b>	11/09/21	<b>Date:</b>	11/09/21	<b>Date:</b>	N/A

Rev	Date	Change	Revised by	Approved
A	06.10.16	New Issue (P/O D206-667-201)	KJ/JLM	
B	09.05.20	Dwg Rev updated	KJ	

Item	Qty -241	Part Number	Description
1	X	D206-667-241	CROSSTUBE ASSEMBLY (206B HIGH AFT)
2	1	D6003-102	CROSSTUBE
3	2	D2891-1	SUPPORT
4	4	D3595-063-395	RUBBER CUSHION
5	4	MS21920-20	CLAMP (OR MS21920-21)
6	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

#### GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6003-102  
FINISHED LENGTH = 100.60±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.  
UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D206-667-241" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 22.5 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 12 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-20 CLAMPS (OR -21) WITH D3595-063-395 RUBBER CUSHIONS TO SECURE THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS MECHANISMS ARE LOCATED ON CROSSTUBE CLAMPS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

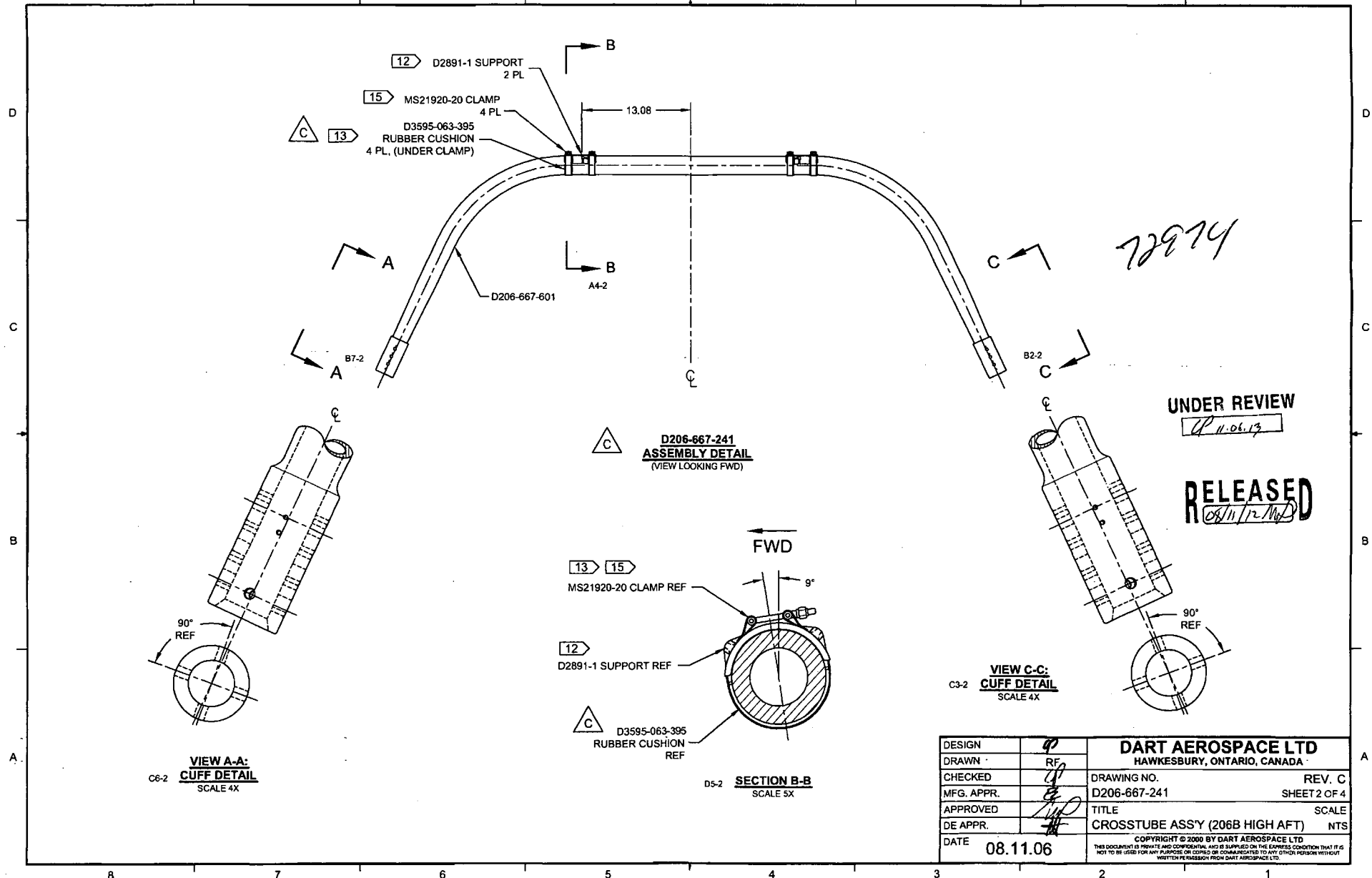
SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 72974

11-08-23 UNDER REVIEW  
11.06.13

RELEASED  
06/11/12 MP

C	REFORMAT/REVISE GENERAL NOTES/PART LIST (ZN D7-1); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS. D3595-063-395 WAS D2856-400-694 (ZN D6-2 & A5-2); REMOVED REF. & ADD TOLERANCES (ZN C5-3, C4-3, D3-3); RELOCATED FLAG #6 (ZN A7-3) PER NCR 210; MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	08.11.06
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	CP	00.11.17
REV.	DESCRIPTION	BY	DATE
DESIGN	<u>MP</u>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA DRAWING NO. D206-667-241 TITLE CROSSTUBE ASS'Y (206B HIGH AFT) COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	
DRAWN	RF		
CHECKED	<u>MP</u>		
MFG. APPR.	<u>MP</u>		
APPROVED	<u>MP</u>		
DE APPR.	<u>MP</u>	REV. C	SHEET 1 OF 4
DATE	08.11.06	SCALE	NTS

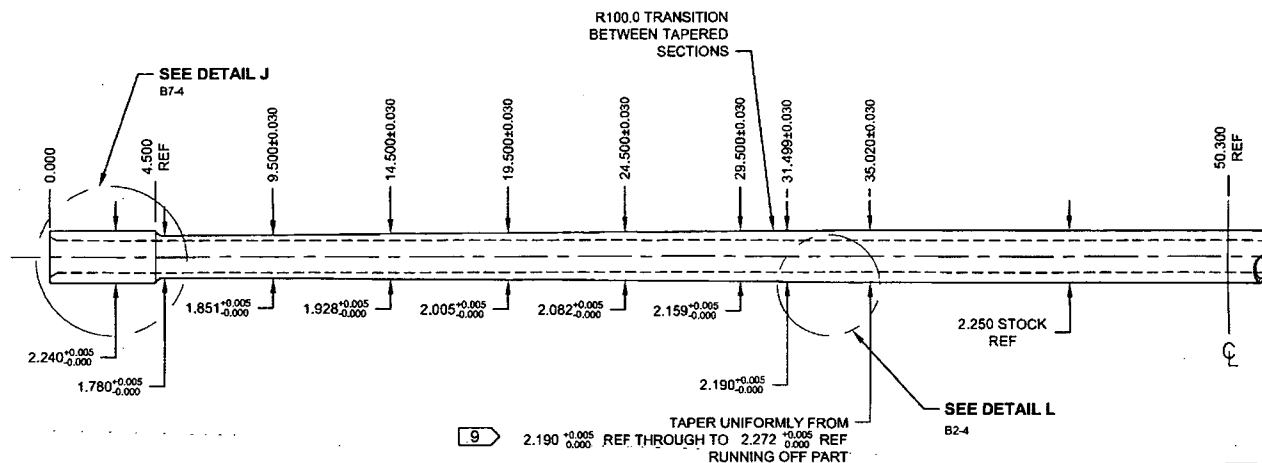
8 7 6 5 4 3 2 1



8 7 6 5 4 3 2 1



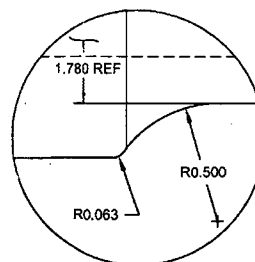
8 7 6 5 4 3 2 1



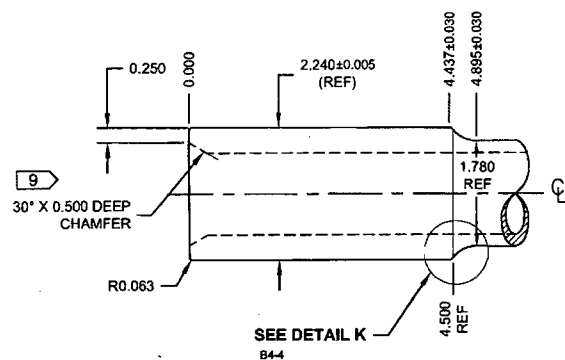
UNDER REVIEW

08.11.06.17

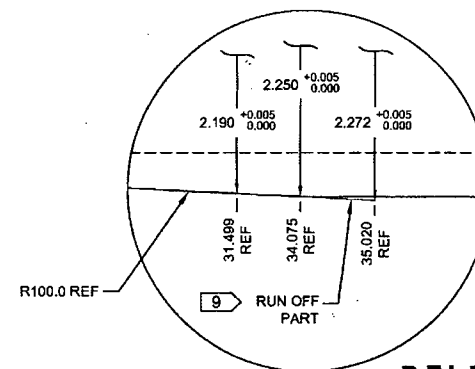
**TURNING DETAIL**



**DETAIL K:  
CUFF TRANSITION**  
NOT TO SCALE



**DETAIL J:  
CROSSTUBE CUFF**  
NOT TO SCALE



**DETAIL L:  
TAPER RUN-OFF**  
NOT TO SCALE

**RELEASED**  
08/11/12

DESIGN	97	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	97	DRAWING NO.	REV. C
MFG. APPR.	97	D206-667-241	SHEET 4 OF 4
APPROVED	97	TITLE	SCALE
DE APPR.	97	CROSSTUBE ASSY (206B HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2000 BY DART AEROSPACE LTD	
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY FORM WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

